WHAT IS CLAIMED IS:

1. A method of interrogating an addressable array unit having a substrate, a light reflecting layer on a front side of the substrate, a light transmitting spacer layer on a front side of the reflecting layer, and a plurality of features on a front side of the spacer layer, the method comprising:

(a) for each of multiple features, illuminating the feature simultaneously with constructively interfering interrogating light which is both reflected and non-reflected from the reflecting layer; and

(b) detecting light emitted from respective features in response to the interrogating light.

2. A method according to claim 1 wherein the interrogating light is initially directed from the front side.

3. A method according to claim 1 wherein the constructive interference provides an illumination power increase of at least 1.5.

4. A method according to claim 1 wherein the interrogating light wavelength, an illumination angle, and a spacer thickness are such that a standing wave is generated from the interrogating light with the features at about an anti-node.

5. A method according to claim 1 wherein the features emit a light of wavelength different from the interrogating light, and

wherein the emitted light wavelength and a detection angle are such that the detected emitted light is a combination of constructively interfering reflected and non-reflected emitted light.

6. A method according to claim 1 wherein the interrogating light is a spot which is scanned across features to illuminate each in turn.

7. A method according to claim 1 wherein at least some of the features include a fluorescent label.

8. A method according to claim 7 wherein the features include corresponding moieties linked to the substrate, the method additionally comprising, prior to illuminating the features, exposing the features to a sample such that at least some of the features bind to respective moieties in the sample which sample moieties include the fluorescent label.

9. A method according to claim 5 wherein the features comprise polynucleotides of respective different sequences hybridized with fluorescently labeled polynucleotides.

10. A method of interrogating an addressable array unit having a substrate, a light reflecting layer on a front side of the substrate, a light transmitting spacer layer on a front side of the reflecting layer, and a plurality of light emitting features on a front side of the spacer layer, the method comprising:

detecting light emitted from respective features, wherein the emitted light wavelength, a detection angle, and a spacer thickness are such that the detected light is a combination of constructively interfering emitted light which is reflected and non-reflected from the reflecting layer.

11. A method according to claim 10 additionally comprising illuminating each of multiple features with an interrogating light, and wherein the features emit light in response to the interrogating light.

12. A method according to claim 10 wherein the emitted light is different in wavelength from the interrogating light.

13. A method according to claim 11 wherein the interrogating light is initially directed from the front side.

14. A method according to claim 10 wherein the detection angle is such that the detected emitted light is at a maximum.

15. A method according to claim 10 wherein the detection angle is greater than zero and less than 90°.

16. A method according to claim 11 wherein the interrogating light is a spot which is scanned across features to illuminate each in turn.

17. A method according to claim 11 wherein at least some of the features include a fluorescent label.

18. A method according to claim 17 wherein the features include corresponding moieties linked to the substrate, the method additionally comprising, prior to illuminating the features, exposing the features to a sample such that the linked moieties of at least some of the features binds to respective moieties in the sample which sample moieties include the fluorescent label.

19. A method according to claim 17 wherein the features comprise polynucleotides of respective different sequences hybridized with fluorescently labeled polynucleotides.

20. A method of interrogating an addressable array unit having a substrate, a light reflecting layer on a front side of the substrate, a light transmitting spacer layer on a front side of the reflecting layer, and a plurality of features on a front side of the spacer layer which emit light of at least two wavelengths, the method comprising:

detecting the emitted light of different wavelengths at respective different detection angles;

wherein the spacer thickness, and each emitted light wavelength and corresponding detection angle are such that each detected different wavelength emitted light is a combination of constructively interfering reflected and non-reflected emitted light.

21. A method according to claim 20 additionally comprising illuminating each of multiple features with an interrogating light, and wherein the features emit the light of different wavelengths in response to the interrogating light.

22. A method according to claim 20 wherein the spacer thickness and each different emitted light wavelength and corresponding detection angle are such that each detected emitted light of different wavelength is at a maximum.

23. A method according to claim 21 wherein the interrogating light is initially directed from the front side.

24. An addressable array unit comprising a substrate, a light reflecting layer on a front side of the substrate, and a plurality of features positioned forward of the light reflecting layer, the unit additionally comprising a light transmitting spacer layer extending from the front of the reflecting layer to the features, the spacer layer being between 50nm to 200nm thick.

25. An addressable array unit according to claim 24 wherein the spacer layer is between 80nm to 150nm thick.

26. An addressable array unit according to claim 24 wherein the multiple features comprise polynucleotides of different sequences.

27. An addressable array unit according to claim 26 wherein the multiple features comprise DNA of different sequences.

28. A kit comprising an addressable array unit according to claim 24, and instructions that the array unit is to be used with an interrogating light of indicated wavelength.

29. A kit comprising an addressable array unit according to claim 24, and instructions that the array unit is to be used with an interrogating light of indicated wavelength.

30. A kit comprising an addressable array unit according to claim 24:

the kit additionally comprising instructions that emitted light during interrogation of the array unit should be detected at a prescribed angle.

31. A kit comprising an addressable array unit according to claim 24:
the kit additionally comprising information on the thickness of the spacer layer.

32. An apparatus for interrogating an addressable array of multiple features of different moieties, comprising:
(a) a detector system which has one or more optical axes so as to detect different emitted light wavelengths at respective different detection angles with an optical axis aligned at each detection angle; and
(b) a processor which receives signals from the detector system and correlates the received signals with respective array features.

33. An apparatus according to claim 32 additionally comprising a light source to provide an interrogating light in response to which the features emit the light of different wavelengths.

34. An apparatus according to claim 32 wherein the detector system comprises at least one detector with an optical axis which can be moved to align with different detection angles.

35. An apparatus according to claim 32 wherein the detector system comprises multiple detectors positioned at the corresponding multiple different detection angles.

36. An apparatus according to claim 32 additionally comprising a reader to read a code carried by an array unit, and a processor which causes the detector system to detect emitted light at a detection angle based on the read code.

37. An apparatus according to claim 33 wherein the light source produces a spot of light at the array, the apparatus additionally comprising a scanning system which scans the interrogating light spot across the array.

38. An apparatus for interrogating an addressable array of multiple features of different moieties, comprising:
(a) a seat which can retain an array unit carrying the array, in a position for interrogation;

(a) a detector system which can collect light at multiple different positions around a cone having an apex at a seated array, and

(b) a processor which receives signals from the detector system and correlates the received signals with respective array features.

39. A method of interrogating an addressable array unit having a substrate, a light reflecting layer on a front side of the substrate, and a plurality of features positioned forward of the light reflecting layer, using an apparatus having a light source to provide an interrogating light to illuminate array features and a detector to detect light emitted from array features in response to the interrogating light, the method comprising:

adjusting a detection angle.

40. A method according to claim 39 wherein the detection angle is adjusted so as to maximize detected emitted light.

41. A method according to claim 39 wherein the detection angle is adjusted based on a read identification from an array unit carrying the array.

42. A computer program product including a computer readable storage medium having a computer program stored thereon which, when loaded into a computer of an array scanning apparatus capable of adjusting a detection angle, causes the apparatus to adjust the detection angle based on an identification read from an array unit carrying the array.